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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MALCOLM M. SMITH

Appeal 2009-003208
Application 10/033,572
Technology Center 2600

Decided: March 10, 2010

Before KENNETH W. HAIRSTON, JOSEPH F. RUGGIERO, and ROBERT E. NAPPI, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 to 40. We have jurisdiction under 35 U.S.C. § 6(b).

We will sustain the rejection.

Appellant's invention is concerned with a wireless communications system (*see* Fig. 1) that uses signal selection and combination to produce a best quality signal based on signal portions or frames (*see* Figs. 6, 14, 15, Abstract). By selecting the best signal portions from several base station signals, a high quality output signal can be determined (i.e., the signal portions are concatenated) (*see* Spec. 10:19-29). Appellant discloses and claims a system, method, and computer-readable medium directing a processor to perform either of the steps of (i) selecting signal portions, and (ii) combining signal portions by adding and/or averaging the signal portions (*see* Spec. 9:25-14:32, claims 1, 9, 17, 25, 33).

Claim 1, reproduced below, is representative of the subject matter on appeal:

1. A communication system, comprising:

a first base transceiver station receiving a first wireless signal from a mobile unit, the first wireless signal comprising:

a first signal portion having a first signal characteristic, and

a second signal portion; and

a second base transceiver station receiving a second wireless signal from the mobile unit, the second wireless signal comprising:

a third signal portion having a second signal characteristic, and

a fourth signal portion, wherein a fifth signal portion is generated by applying a processing operation to the first and third signal portions, independently from the second and fourth signal portions, the processing operation operable to perform either of the steps of:

selecting one of the first and third signal portions using the first and second signal characteristics, and

combining the first and third signal portions, wherein combining includes adding or averaging the first and third signal portions.

The Examiner relies upon the following as evidence of unpatentability:

Obuchi	US 6,320,852 B1	Nov. 20, 2001 (filed Mar. 2, 1998)
Kondo	US 6,728,919 B1	Apr. 27, 2004 (filed Aug. 20, 1999)

The following sole rejection is before us for review:

Claims 1 to 40 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Kondo and Obuchi.

The Examiner relies upon Kondo as describing all of the features of a system and method for communicating using a first base transceiver station receiving first and second signal portions, a second base transceiver station receiving third and fourth signal portions, and generating a fifth signal

portion by processing the first and third signals by selecting one of the first and third signal portions (Ans. 3). The Examiner relies upon Obuchi as describing a communication system and method which not only selects a first or third signal portion, but also combines those signal portions by adding and/or averaging them (Ans. 4). The Examiner determined that it would have been obvious "to add the additional combining (composite) function together with the selecting function of Kondo's system for the purpose of increasing the performance of the system" (Ans. 4).

Appellant contends, *inter alia*, that (i) no motivation to combine Kondo and Obuchi exists other than hindsight (App. Br. 10-11, Reply Br. 10-12, Supp. Reply Br. 10-12); (ii) the Examiner has not shown a reasonable expectation of success for Kondo as modified by Obuchi to perform the claimed invention (App. Br. 11-12, Reply Br. 12-13, Supp. Reply Br. 12-14); and (iii) Kondo and Obuchi, whether taken individually or in combination, fail to teach or suggest all of the features recited in independent claims 1, 9, 17, 25, and 33 (App. Br. 12-14, Reply Br. 13-16, Supp. Reply Br. 14-18).

ISSUE

Based on Appellant's arguments, the obviousness issue is whether it would have been obvious to one of ordinary skill in the art to combine the communications systems and methods taught by Kondo and Obuchi, thereby rendering obvious the communication systems, method, and computer-readable medium directing a processor to perform either of the steps of (i) selecting signal portions, and (ii) combining signal portions by adding and/or

averaging the signal portions?

Based on Appellant's arguments with regard to obviousness, an additional issue presents itself: does a proper construction of the independent claims on appeal require the system, method, and computer-readable medium to be operable to perform the combining step set forth in claims 1, 9, 17, 25, and 33?

FINDINGS OF FACT

1. As indicated *supra*, Appellant describes and claims generating a final signal portion by applying a processing operation to the first and third signal portions by performing either of the steps of (i) selecting one of the first and third signal portions based on their signal characteristics (e.g., signal quality, noise ratio, etc.), and (ii) combining the first and third signal portions by adding and/or averaging the first and third signal portions (*see* Spec. 9:25-14:32, claims 1, 9, 17, 25, 33). Appellant recognizes the need for improving "the capacity and/or coverage of a wireless communications system . . . by reducing the required transmit power of the MU in simultaneous communications with multiple BSTs" (Spec. 5:12-18).
2. Appellant describes determining signal quality parameters by using averaging, as follows:

> Various types of signal quality parameters and/or characteristics can be utilized as indicators of signal quality. For example, there is a signal-to-noise ratio (SNR) and/or a signal-to-interference ratio (SIR) associated with each bit received by a BTS. High signal

> quality is generally associated with high SNR and/or high SIR. *The mean (e.g., the arithmetic mean)* of the respective SNRs or SIRs of a bit 702 within the payload 138 of a frame can be utilized as an indicator of the quality of reception of the frame, and based upon this criterion, the best frame can be selected from among the corresponding copies received by the respective BTSs 14.
>
> Other criteria can also be used to select a preferred frame from among the copies received by the various BTSs 14. For example, an algorithm in accordance with the present invention can select the frame with the highest energy-per-bit (Eb), the lowest error-per-bit, or can select only those frames which pass an error-detection procedure such as, for example, the well-known Cyclic Redundancy Check (CRC).
>
> In accordance with an additional aspect of the present invention, data from the various BTSs 14 can be selected on a bit-by-bit basis. In other words, the respective copies of each bit which are received by the respective BTSs 14 can be compared based upon SNR, SIR, energy, Eb, CRC, or another criterion indicating the quality of reception. The bit or bits having the best quality can be selected.

Spec. 10:30-11:25 (emphasis added).

3. Appellant describes the processing operation of combining signals as follows:

> In accordance with another aspect of the present invention, signals received by multiple BTSs can be combined on a bit-by-bit or symbol-by-symbol basis by adding and/or averaging the energy and/or voltage

> associated with each copy of a bit or symbol received through a set of BTSs.

Spec. 14:1-6. Appellant describes the selecting and combining processes again at page 18 of the Specification, as follows:

> In accordance with the present invention, the SDU function includes *selection* of digital data signals corresponding to the best quality wireless data signal or signals received by the primary BTS 378 and the secondary BTSs 382. As discussed above, the selection need not be based solely upon which signals, considered in their entirety, have the best quality. *The selection can also be based which portions (e.g., frames) of the wireless signals have the best quality.* The selection procedure is preferably performed on a frame-by-frame basis. Preferably, the SDU function includes *combination* of digital data signals corresponding to two or more of the wireless data signals 502 received by the primary BTS 378 and the secondary BTSs 382. *The combination procedure preferably includes adding and/or averaging* of the respective amplitudes and/or power levels of the wireless data signals 502, and is preferably performed on a frame-by-frame basis.

Spec. 18:14-32 (italicized emphases added) (underlined emphasis in original).

4. Kondo describes a system and method for communicating between a mobile station 5 and a base station controller 6 using a first base station 1 receiving plural signal portions, a second base station 3 receiving plural signal portions, and generating an output signal portion by processing using a diversity reception method to select one

of the signal portions (*see* Figs. 1, 2, 5, 7, 17, col. 1, ll. 7-11, col. 1, l. 48 to col. 2, l. 17).

5. Kondo employs a site diversity reception method (*see* col. 1, ll. 44-45) which can transmit data with a reduced error rate (col. 3, ll. 45-47) by using a base station controller to select a signal portion (e.g., a frame or a bit) from plural signal portions (e.g., frames or bits) having the highest reception level (i.e., lowest error rate) (col. 2, l. 65 to col. 3, l. 42, col. 4, ll. 57-67, col. 5, ll. 18-27). Error checking is performed by majority decision (Fig. 18, col. 15, ll. 55-65).
6. Obuchi describes a communication system and method which selects at least two signal portions from base stations 2-1, 2-2, and 2-3 and employs a composite device 35 (*see* Fig. 6) to combine the signal portions into one signal by weighting them to produce a composite signal (*see* Abstract, Fig. 8(b), col. 24, ll. 3-49; col. 34, ll. 56-62). Obuchi uses a "majority determination" to process the signals in the composite device 35 (col. 24, ll. 7-10). Composite device 35 (and composing section 35A) "composes the signals into one signal while assigning the previously[-]measured error rates as *weights* to the signals" (col. 34, ll. 60-62) (emphasis added).
7. Obuchi describes an exchange 3F including a selector which selects from the signals to selectively output a data signal having a superior error rate (Fig. 20, col. 34, ll. 63-67). Obuchi describes this as a site diversity receiving method (col. 1, ll. 10-20).
8. Obuchi discloses that "[s]ince the signals received from the base stations 2-1 to 2-3 can be composed into one signal while weighting

the signals according to the error rates, more accurate data can be obtained" and "performance of the mobile communications system can be improved" (col. 35, ll. 27-31). Obuchi's method can "improve the error rate of a received signal without increasing the amount of signal data flowing between the base stations and the base-station host apparatus" (Abstract).

PRINCIPLES OF LAW

Claim Construction

"During examination, 'claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.'" *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (citation omitted); *In re Morris*, 127 F.3d 1048, 1053-54 (Fed. Cir. 1997). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (citation omitted).

> Additionally, [t]hough understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.

SuperGuide Corp. v. DirecTV Enterprises, Inc., 358 F.3d 870, 875 (Fed. Cir. 2004).

Obviousness

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). The Examiner's articulated reasoning in the rejection must possess a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

ANALYSIS

At the outset we note that each of the independent claims on appeal (claims 1, 9, 17, 25, 33) recites the same subject matter which is at issue in this case: generating a final signal by applying a processing operation which is "operable to perform *either* of the steps of : [i] selecting one of the . . . signal portions using . . . signal characteristics, *and* [ii] combining the . . . signal portions, wherein combining includes adding or averaging the . . . signal portions" (claims 1, 9, 17, 25, 33) (emphases added). Appellant only presents arguments with respect to the independent claims, and does not contest the rejection of any of the dependent claims.

We will sustain the Examiner's rejection with respect to independent claims 1, 9, 17, 25, and 33 for the reasons that follow. We agree with the Examiner's findings of fact and conclusions of obviousness with respect to claims 1 to 40 (Ans. 3-8), and adopt them as our own, along with some amplification of the Examiner's explanation of the teachings of Kondo (FF 4, 5) and Obuchi (*see* FF 6-8). *See Fine*, 837 F.2d at 1073; *Kahn*, 441 F.3d at 988.

Claims 1, 9, 17, 25, and 33 merely require that *either* of two operations be performed: (i) "selecting . . . ," *and* (ii) "combining . . ." (*see* claims 1, 9, 17, 25, 33). The broadest reasonable interpretation of the phrase "either" indicates that a processing operation performing one or the other of the two functions recited in the claims (e.g., selecting and combining) would be encompassed by the language of the claims. *See Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d at 1364. In other words, the broadest reasonable interpretation of claims 1, 9, 17, 25, and 33 merely requires that a communications system, method, or computer-readable medium direct a processor to receive signal portions from first and second base transceiver stations and generate a final signal by applying a processing operation operable to perform the selection step. The broadest reasonable interpretation of claims 1, 9, 17, 25, and 33 does not require the system, method, and computer-readable medium to be operable to perform the combining step set forth in claims 1, 9, 17, 25, and 33. Therefore, in light of our findings with respect to Kondo (FF 4, 5) and Obuchi (FF 6-8) *supra*, the applied references, whether taken individually or in combination, disclose or suggest all of the required limitations of the independent claims as broadly interpreted.

Another interpretation of claims 1, 9, 17, 25, and 33, and one that the Examiner and Appellant have taken as evidenced from the arguments of record, is that these claims require that *both* the selecting and the combining steps be performed. And, if this interpretation is taken, the last step of the claims, the combining operation, merely requires that combining occur by "adding *or* averaging" (*see* claims 1, 9, 17, 25, 33) (emphasis added). Thus,

only one form of combining need take place, either combining including (i) "adding" of the signal portions, or (ii) "averaging."

A proper interpretation of claims 1, 9, 17, 25, and 33, giving these claims their broadest reasonable interpretation consistent with the Specification as understood by one of ordinary skill in the art (*Phillips*, 415 F.3d at 1315), has to rely on any definition provided in the originally filed Specification. The Specification (*see* FF 2-4) does not provide any definitions for "adding" or "averaging," however these are commonly used terms in mathematics and in the signal communication field. Adding is simply the operation of summing or combining two or more signals or values. An average can be a mean, mode, or median.

The Specification (FF 2) only sheds light on one example of averaging, that of taking an arithmetic mean. Although Appellant's Specification provides the specific example of averaging as taking a mean, "a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment." *SuperGuide*, 358 F.3d at 875. In the instant case, the use of the phrase "averaging" in claims 1, 9, 17, 25, and 33 is not limited to the specific example provided in the Specification. Accordingly, broadly interpreted, the independent claims on appeal encompass an averaging operation using a mode or a median.

As indicated *supra* (FF 6-8), Obuchi describes the salient features of claims 1, 9, 17, 15, and 33 including combining signals using a weighting operation and composing a final signal. The weighting operation assigns weights to the signal portions which are then combined into a composite

signal (FF 6). Broadly interpreted, Obuchi's composing operation performs adding to the extent "adding" is claimed and described in Appellant's Specification. Obuchi assigns different weights to different signal portions and then adds or combines them into a composite signal (FF 6, 8). Furthermore, taking a majority determination is considered taking a mode, which is a type of averaging. Therefore, Appellant's contentions (App. Br. 13; Reply Br. 14; Supp. Reply Br. 15) that Obuchi's "majority determination technique is hardly the same as adding or averaging signal portions" are therefore unpersuasive. Similarly, while we agree with Appellant that Obuchi's Figure 8(b) shows a majority determination process, Appellant's arguments (App. Br. 13, Reply Br. 15, Supp. Reply Br. 17-18) that Obuchi's Figure 8(b) does not disclose adding or averaging signal portions are unpersuasive. Broadly interpreted, the language of each independent claim on appeal encompasses the combining step including "adding or averaging" two signal portions (claims 1, 9, 17, 25, 33), as described by Obuchi (FF 6).

Appellant's arguments that Kondo and Obuchi, taken individually or in combination, fail to disclose or suggest selecting or processing signal portions on either a (i) frame-by-frame, or (ii) bit-by-bit basis are unpersuasive inasmuch as these arguments are not commensurate in scope with the claim language. Claims 1, 9, 17, 25, and 33 do not contain the phrases "frame-by-frame" or "bit-by-bit," or even the terms "frame" or "bit." Even so, we note that Kondo operates on frames and bits, and thus discloses such a feature (FF 5).

Both Kondo and Obuchi are from the same field of endeavor as Appellant's invention, wireless communications systems using diversity

reception techniques to select the best portions of a signal for composition into a final signal based on signal portion characteristics such as error rate (*compare* FF 1 *with* FF 4, 5 *and* FF 6-8). The best signal portions are concatenated to produce the best final signal. In addition, not only do both Kondo (FF 4, 5) and Obuchi (FF 7) employ site diversity reception, but they both describe using majority determination (*see* FF 5, 6). We agree with the Examiner that it would have been obvious to modify Kondo with the weighting technique of Obuchi in order to increase system performance (Ans. 4). In addition, it would have been obvious to employ the composing and combining feature including adding and averaging (using the mode methodology) of Obuchi to enhance Kondo's system and method in order to obtain more accurate data and improve the error rate of received signals as recognized by Obuchi and Kondo (*see* FF 5, 8). This would in turn be understood by one of ordinary skill in the art to reduce the required transmit power of a cellular phone since unwanted and incorrect bits would not need to be transmitted, accomplishing the objective recognized by Appellant as desirable in wireless communications systems, reducing transmit power (*see* FF 1).

The Examiner has provided articulated reasoning with a rational underpinning to support the combination for the legal conclusion of obviousness (Ans. 3-8). *See Kahn*, 441 F.3d at 988. Appellant has failed to rebut the Examiner's showing that Kondo and Obuchi teach or suggest all of the limitations of claims 1, 9, 17, 25, and 33. Appellant's contentions that (i) no motivation to combine Kondo and Obuchi exists other than hindsight (App. Br. 10-11, Reply Br. 10-12, Supp. Reply Br. 10-12), and (ii) there is

no reasonable expectation of success for Kondo as modified by Obuchi to perform the claimed invention (App. Br. 11-12, Reply Br. 12-13, Supp. Reply Br. 12-14) are unpersuasive.

In view of our discussion as to the breadth of the claim terminology, along with the teachings and suggestions of Kondo and Obuchi *supra*, Appellant has not demonstrated that the Examiner erred in relying on the combination of Kondo and Obuchi as teaching or suggesting a communication system, method, and computer readable-medium operable to direct a processor to receive signal portions from first and second base transceiver stations and generate a final signal by selecting one of the signal portions and combining signal portions, as set forth in independent claims 1, 9, 17, 25, and 33.

Under the broadest reasonable interpretation, the independent claims on appeal do not require the combining operation set forth at the end of claims 1, 9, 17, 25, and 33. As indicated *supra* (FF 4-8), both Kondo and Obuchi describe all of the elements of the independent claims including a selection operation which is commonplace in wireless communications systems using site diversity reception to receive a signal from multiple base stations. In other words, claims 1, 9, 17, 25, and 33 read in their entirety on Kondo or Obuchi, whether considered alone or in combination with each other, and the teachings of one are cumulative of what is disclosed by the other.[1]

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[1] "[A] lack of novelty in the claimed subject matter, e.g., as evidenced by a complete disclosure of the invention in the prior art, is the 'ultimate or
Footnote continued on next page.

For all of the above reasons, Appellant's arguments have not persuaded us of error in the Examiner's rejection of claims 1, 9, 17, 25, and 33 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kondo and Obuchi. One of ordinary skill in the art would have found Appellant's claimed subject matter in claims 1, 9, 17, 25, and 33 obvious in light of the combination of Kondo and Obuchi. Accordingly, we sustain the rejection of claims 1, 9, 17, 25, and 33. Claims 2 to 8, 10 to 16, 18 to 24, 26 to 32, and 34 to 40 were not argued separately, and fall together with their respective independent claims. *See* 37 C.F.R. § 41.37(c)(1)(vii). Therefore, we sustain the rejection of these claims for the same reasons discussed with respect to claims 1, 9, 17, 25, and 33.

CONCLUSION OF LAW

It would have been obvious to one of ordinary skill in the art to combine the communication systems and methods taught by Kondo and Obuchi, thereby rendering obvious the communication systems, method, and computer-readable medium directing a processor to perform either of the steps of (i) selecting signal portions, and (ii) combining signal portions by adding and/or averaging the signal portions.

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epitome of obviousness.'" *In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982) (internal citation omitted). "[A] rejection for obviousness under § 103 can be based on a reference which happens to anticipate the claimed subject matter." *In re Meyer*, 599 F.2d 1026, 1031 (CCPA 1979).

A proper construction of the independent claims on appeal does not require the system, method, and computer-readable medium to be operable to perform the combining step set forth in claims 1, 9, 17, 25, and 33.

ORDER

The decision of the Examiner to reject claims 1 to 40 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

gvw

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